## Graphing Inequalities

Upon completion of this task you should have addressed all of the green highlights.

**Common Core State Standards**

**MCC9‐12.A.REI.12** Graph the solutions to a linear inequality in two variables as a half‐plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half‐planes.

1. Use Geogebra to graph the inequality *y* > – ½ *x* + 5. What are some solutions to the inequality? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Paste Graph here.
2. Use Geogebra to graph the inequality *y* < *x* + 2. What are some solutions to the inequality? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Paste Graph here.
3. Look at both graphs.
   1. Are there any solutions that work for both inequalities? Give 3 examples of solutions that work.

1.

2.

3.

* 1. Are there any solutions that work for 1 inequality but not the other? Give 3 examples and show which inequality it works for.

1. Graph both inequalities on the same coordinate system using Geogebra. Use a different color to shade each. Paste Graph here.
   1. Look at the region that is shaded in both colors. What does this region represent?
   2. Look at the regions that are shaded in only 1 color. What do these regions represent?
   3. Look at the region that is not shaded. What does this region represent?
2. Graph the following system on the same coordinate grid using Geogebra. Use different colors for each.

*x* + *y* ≥ 3

*y* ≤ –*x* + 5

Paste graph here.

1. Give 3 coordinates that are solutions to the system.
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Give 3 coordinates that are not solutions to the system.

1.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Is a coordinate on either line a solution? Coordinate: \_\_\_\_\_\_\_\_\_\_\_\_\_
2. How would you change the inequality *x* + *y* ≥ 3 so that it would shade below the line? Answer in complete sentences.
3. How would you change the inequality *y* ≤ – *x* + 5 so that it would shade above the line? Answer in complete sentences.
4. Use Geogebra to graph the new equations from ‘d’ and ‘e’ above on the same coordinate grid. Use blue for one graph and red for the other. Paste graph here.
   1. What do the coordinates in blue represent? Answer in a complete sentence.
   2. What do the coordinates in red represent? Answer in a complete sentence.
   3. Why do the colors not overlap this time? Answer in a complete sentence.

Using Geogebra graph the following on the same coordinate grid and give 3 solutions for each. Be sure to paste your graphs into this document.

1. 2*x* + 3*y* < 6

*x* + 5*y* > 5

1. *y* ≥ ½ *x* – 1

*y* ≤ –¼ *x* + 6

1. 3*x* – 4*y* > 5

*y* > ¾ *x* + 1